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(54) **PROCESS FOR FEEDING PRODUCTS OF VARIABLE HEIGHT AND LENGTH INTO A CONTINUOUS PACKAGING APPARATUS**

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B65B 9/06 (2006.01)

(52) **U.S. Cl.** **53/450**; 53/55; 53/504

(58) **Field of Classification Search** 53/504, 53/55

See application file for complete search history.

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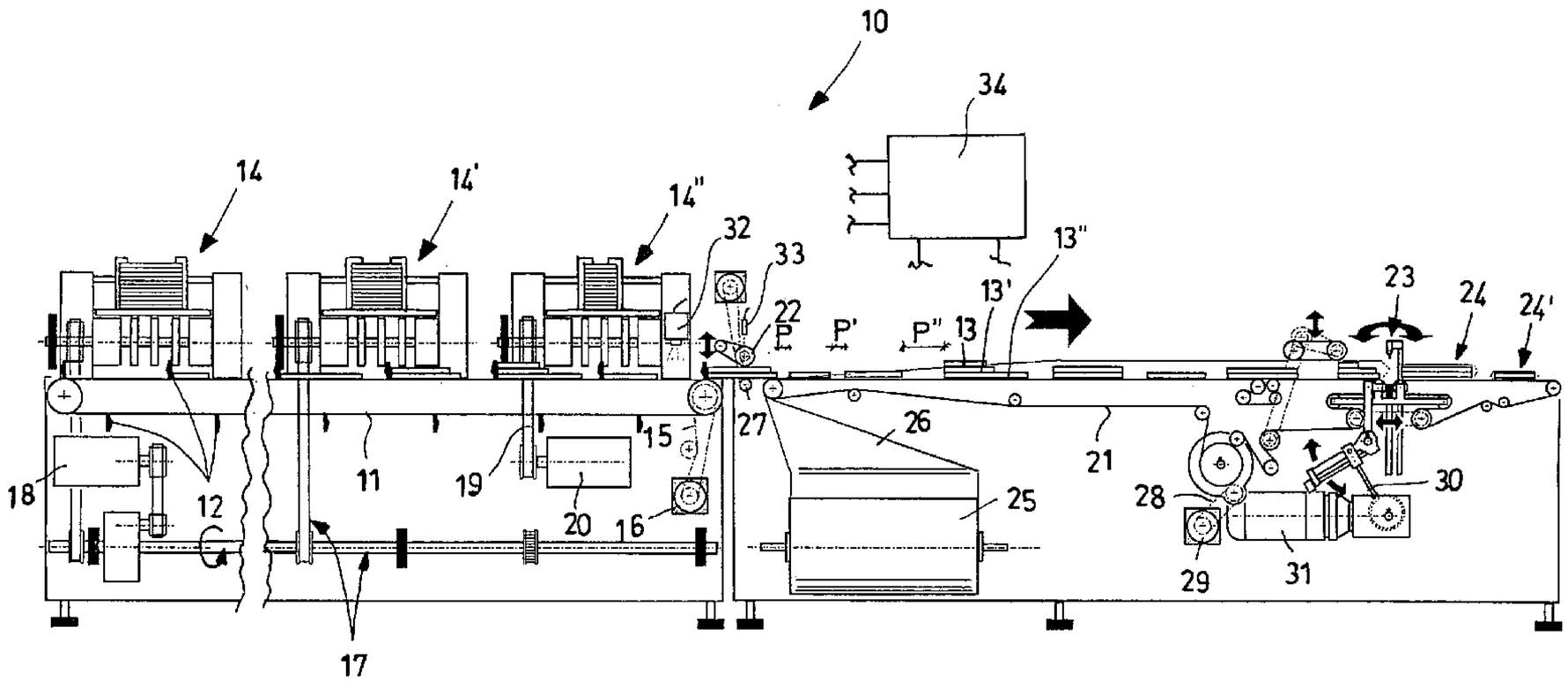
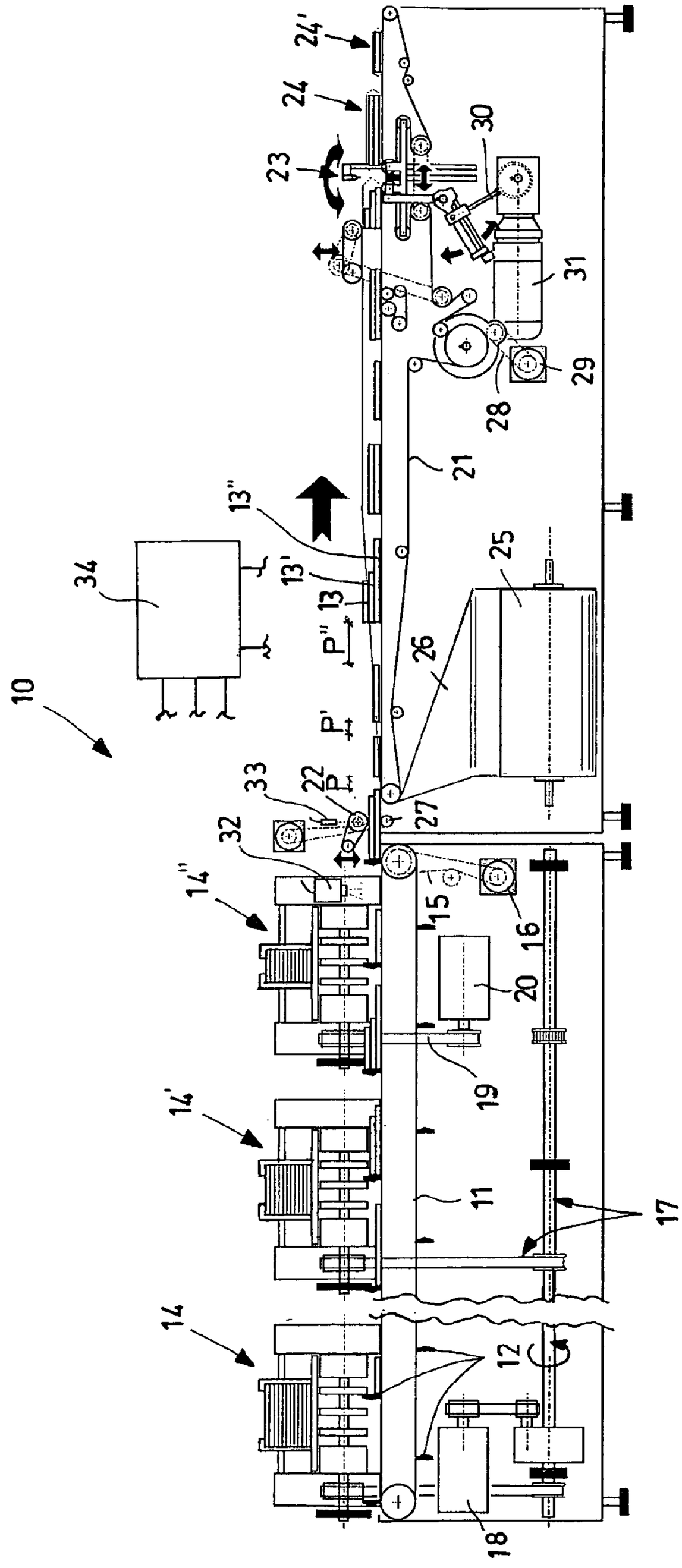
(57) **ABSTRACT**

A Process for feeding products of variable height and length into a continuous packaging apparatus comprising a conveyor with thrusters that receives publishing products or similar, such as newspapers, magazines, books, envelopes, giveaways or other similar products, from a certain number of feeders, a conveyor belt where the packaging in a plastic or paper film takes place, fed continuously above the conveyor belt that foresees, in a downstream area, longitudinal and transversal sealing devices that make finished packages of various sizes in height and length, said process comprising the steps of: varying the pitch on the conveyor belt of the products or groups of products fed by the conveyor with thrusters through continuous variation of the speed of the conveyor belt, and operatively adapting the speed of the sealing devices to the sizes in height and length of the products or groups of products.

5 Claims, 1 Drawing Sheet

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PROCESS FOR FEEDING PRODUCTS OF VARIABLE HEIGHT AND LENGTH INTO A CONTINUOUS PACKAGING APPARATUS

The present invention refers to a process for feeding products of variable height and length into a continuous packaging apparatus.

In the field of the selection and transportation of so-called publishing products, such a sheeted products or similar, newspapers, magazines, books, envelopes, giveaways or other supplements, in particular coming from feeders associated in parallel with packaging apparatuses, up to now a solution has not been found for the continuous packaging of products having a continuously variable length and height, variously combined together.

Indeed, in general, the packaging machine and its feeding parts are currently adjusted according to the products that must be fed that must be of the same or similar size, with constant measurements, to be able to have a correct operation of the various parts of the machine.

As these sizes change, the machine is stopped and reset with the new parameters before being able to restart its packaging work of products having substantially predetermined sizes.

The purpose of the present invention is therefore that of solving such problems, trying to carry out continuous packaging of publishing products that are continuously variously associated and of variable size in height and in length, without needing any stopping of the machine.

This purpose according to the present invention is accomplished by carrying out a process for feeding products of variable height and length into a continuous packaging apparatus, according to what is outlined in the independent claims.

Other characteristics emerge from the subsequent attached claims.

The characteristics and advantages of a process for feeding products of variable height and length into a continuous packaging apparatus according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, referring to the attached schematic drawing, in which a top side view of a continuous packaging apparatus is illustrated that carries out the process for feeding products of variable height and length.

With reference to the drawing, a continuous packaging apparatus is schematically shown, indicated with 10, comprising a conveyor **11** with thrusters **12** that receives publishing products or similar **13**, **13'**, **13"**, etc., such as newspapers, magazines, books, envelopes, giveaways or other similar products, from a certain number of feeders schematised at **14**, **14'**, **14"**, etc.

The conveyor **11** is motorised through a transmission **15** and a motor **16**, whereas the feeders are motorised, for example those indicated with **14**, **14'** through a centralised transmission **17** and a single motor **18**, and the one indicated with **14"** with relative transmission **19** through a motor **20**.

Such products **13**, **13'**, **13"**, variously associated thanks to the selective feeding from the various feeders **14**, **14'**, **14"**, are fed according to a suitably selected pitch p, p', p", etc. to a conveyor belt **21** where the definitive packaging takes place. Indeed, at an area downstream of such a conveyor belt **21** longitudinal and transversal sealing devices 23 are foreseen that make finished packages **24**, **24'**, etc. of various sizes in height and length with the process according to the invention.

Below the conveyor belt **21** a roll 25 of plastic or paper film 26 is foreseen that is continuously fed above the conveyor belt **21** ready to receive above it the groups of products that are received from the conveyor **11** with thrusters **12**.

A small upper entry belt **22** that can be displaced in height and a lower motorised roller **27** make a highly adjustable feeding group that eases and collaborates with such feeding between the conveyor **11** with thrusters **12** and the conveyor belt **21**.

A suitable transmission **28** commanded by a motor **29** actuates the advancing of the entire conveyor belt **21**, whereas a further composite transmission **30** actuated by a respective motor **31** selectively activates the longitudinal and transversal sealing devices **23**.

A sensor **32** for detecting the height of the group of piled up products associated with at least one sensor **33** for detecting length are foreseen, said sensors determining the pitch between the successive groups of products alternatively and/or in collaboration with a central computer, schematised at **34**.

Of course, the central computer **34** also manages all of the motors quoted previously and possible other auxiliary devices so as to allow the packaging process to be synchronised and actuated.

Therefore, according to the invention, following the programmed feeding in successive piled up combination of preselected products **13**, **13'**, **13"**, etc. the conveyor **11** with thrusters **12** receives groups of products. Of course, these products are fed according to a predetermined sequence one upon the other by the various feeders **14**, **14'**, **14"**, etc. combined with the conveyor **11** with thrusters **12**.

The advancing of such products or groups of products **13**, **13'**, **13"**, etc. is signalled by the computer **34** to the various motors so that it is possible to actuate the process of the invention. In particular, according to the maximum length and height of each group of products, a variation of the pitch p, p', p", etc. between the various groups of products takes place.

Such a variation is carried out by continuously varying the speed of the conveyor belt **21** according to the maximum length and height of each group of products that arrives from the conveyor **11** with thrusters **12** and operatively adapting the speed of the sealing devices **23** to the sizes in height and length of the products or groups of products **13**, **13'**, **13"**, etc. that have arrived on the conveyor belt **21**.

Therefore, the computer **34** foresees continuous control and command of the speed of the motor **29** that actuates the transmission of the entire belt of the conveyor **21**. Moreover, it foresees continuous control and command of the speed of the motor **31** that actuates the composite transmission **30** that in turn selectively activates the longitudinal and transversal sealing devices **23**.

Alternatively or else in parallel, the sensor **32** that is able to detect the maximum length and height of each group of products coming out from the conveyor **11** with thrusters **12** can take care of activating the computer **34** or else of confirming the command thereof quoted previously.

It is also possible to foresee a further sensor **33** for detecting length that collaborates with the possible control of the real length of each group of products, activating the confirmation of the variation of the pitch between the successive groups of products in collaboration with the central computer **34**.

The present invention thus provides a solution to the problems of the prior art by carrying out continuous packaging of publishing products that are continuously variously

associated and of variable size in height and in length, without needing any stopping of the packaging apparatus.

The invention claimed is:

1. A Process for feeding products of variable height and length into a continuous packaging apparatus comprising a variable speed conveyor (**11**) with a plurality of thrusters (**12**) that receives publishing products (**13**, **13'**, **13"**), from a plurality of feeders (**14**, **14'**, **14"**), a second adjustable pitch conveyor belt (**21**) where plastic or paper film (**26**) is fed continuously above said second conveyor belt (**21**) and towards a plurality of longitudinal and transversal sealing devices (**23**) that make finished packages (**24**, **24'**) of various sizes in height and length; said apparatus further characterized by a centralized computer (**34**) that directs the packaging process, said process comprising the steps of: varying the pitch on said second conveyor belt (**21**) of said products or groups of products (**13**, **13'**, **13"**) fed by the conveyor (**11**) with thrusters (**12**) through continuous variation of the speed of said second conveyor belt (**21**), and operatively adapting the speed of said sealing devices (**23**) to the sizes in height and length of said products or groups of products (**13**, **13'**, **13"**), said apparatus is further characterized in that in a step of passing over said products or groups of products (**13**, **13'**, **13"**) between said conveyor (**11**) with thrusters (**12**) and said conveyor belt (**21**) the position in height of a height-adjustable feeding group (**22**, **27**) is varied according to the height of said products or groups of products (**13**, **13'**, **13"**).

2. The process according to claim **1**, further characterized in that a height detector mechanism (**32**), which detects the height of said products or groups of products (**13**, **13'**, **13"**) is located at the exit of said conveyor (**11**) with thrusters (**12**).

3. The process according to claim **1**, characterized in a length detector mechanism (**33**), which detects the length of said products or groups of products (**13**, **13'**, **13"**, etc.) at the exit of said conveyor (**11**) with thrusters (**12**).

4. Process according to claim **1**, characterized in that said feeders (**14**, **14'**, **14"**) are activated through a centralized transmission (**17**) and a single motor (**18**).

5. Process according to claim **1**, characterized in that said feeders (**14**, **14'**, **14"**) are each activated with a relative transmission (**19**) through a respective motor (**20**).

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